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(51) INT CL<sup>7</sup>

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(54) Abstract Title

**Simultaneous translation**

(57) Simultaneous translation system comprising a portable housing-casing which holds a data processor, a hard disk, the necessary software (dictionaries, language translators and voice reproducers), a modem providing connection to the Internet, a printer output port, a compact disk drive, a liquid crystal display screen, for the control menu and another used to read the last sentence in use, as well as a telephone, a microphone, headphones or earphones, a cassette recorder, loudspeakers, a battery or power cell and a keyboard connection. The translation may be carried out on one system or between two systems, via the Internet or by telephone, on which a menu is displayed, where an input and output language is selected for the sender system, activating the voice processing program, which processes the signal received by the microphone and transcribes it to text, in which moment the translation program is executed which translates the text into the language chosen, it being possible to view this on the screen or on the receiver system (in the case of two systems being connected) on which the voice program is executed which carries out the inverse function by converting the translated text to voice, via the loudspeakers.

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At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

Fig.1

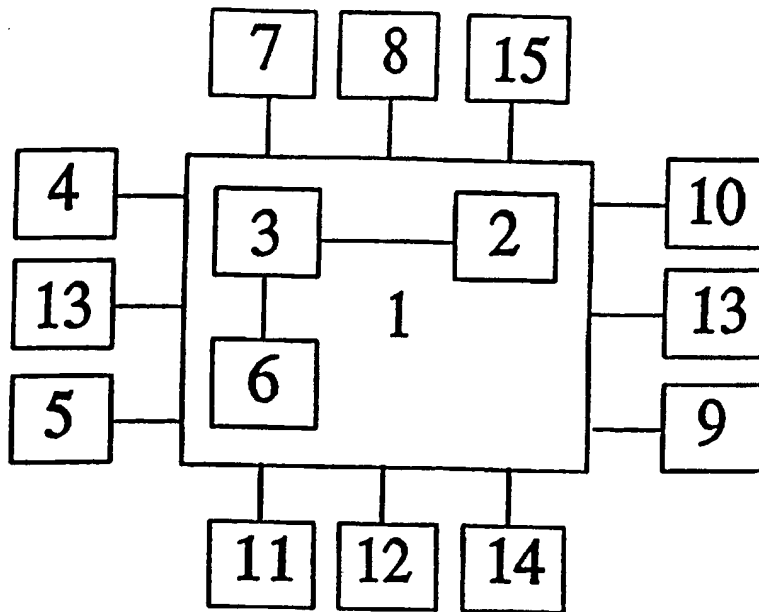


Fig.2

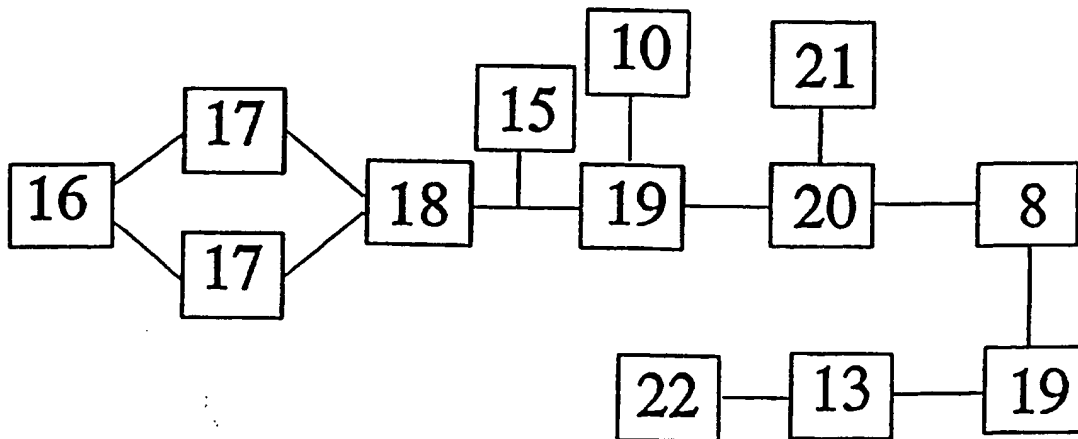
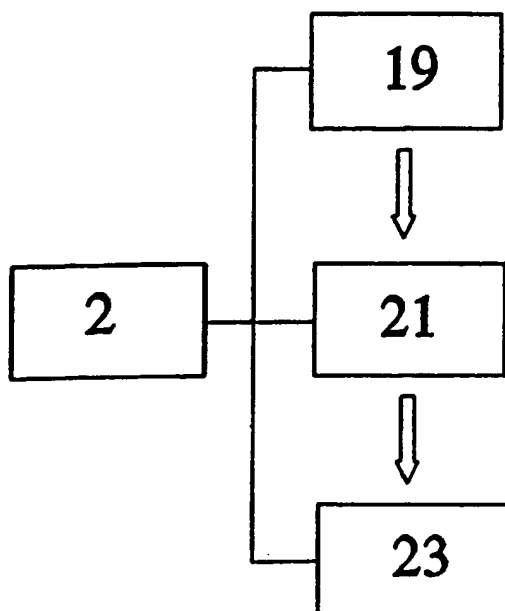


Fig.3



## SYSTEM AND METHOD FOR SIMULTANEOUS TRANSLATION

The present invention relates to a system and method for simultaneous translation.

Simultaneous translation machines have recently experienced considerable growth, due mainly to the development of new voice and translation processors, which are increasingly able to achieve optimum standards of translation.

Translator machines are available on the market which, using an internal translation program, permit a text entered via the keyboard to be translated into another language, visible on the screen.

Another type of machine which is less developed incorporates a text to voice conversion program.

It is these programs which currently present the greatest area for development as they permit the translation and conversion of a written text into a set of words.

The new simultaneous translation system and procedure permits two interlocutors speaking different languages to communicate without the physical presence of a translator-interpreter, until now a necessary requirement.

Basically, the new system comprises a housing-casing which holds a data processor, a hard disk, the necessary software (dictionaries, language translators and voice reproducers), a modem providing connection to the Internet, a printer output port, a compact disk drive, a liquid crystal display screen for the control menu and another used to read the last sentence in use, as well as a telephone with input and output lines, a microphone, headphones, earphones, a cassette recorder, loudspeakers, a battery or power cell and finally a keyboard connection for use by people with impediments or disabilities.

Once the system is connected, either via battery or to the mains supply, a menu is displayed from which both the input and output language should be selected,

which is to say, the language which the user wishes to translate and the language into which this should be translated in spoken form.

Two methods of using the translator device exist, it either being employed between two different systems or on a single system.

5 In the case of using two different systems, the connection is established via a modem connected to the Internet or by telephone.

For the connection between two different systems, once the languages have been chosen from the start menu the connection is established either via modem to the Internet or by telephone, and the number of the receiver with  
10 which the user wishes to speak is dialled, this possessing the same simultaneous translation system.

A message notifies the receiver that the sender wishes to communicate with them via the simultaneous translation device.  
15

The mode of communication will be via keyboard, microphone or a hands-free microphone and earphones set.

In the case of connection via the Internet, the following procedure is  
20 followed:

The voice recognition program is activated, and at the same time the text entry program is activated on the screen of the sender.

25 The system includes dictionary programs for the various languages with which it is to work.

From this moment on the sender is able to speak into the microphone, clearly and precisely, the voice program processing the signal and transcribing it  
30 to text.

Once the signal has been processed and transcribed to text, a translation program is activated which translates the text into the language previously selected.  
35

Said texts can be viewed on both the sender system and the receiver system.

At this moment, the voice program is activated on the receiver system which carries out the inverse function by converting the text translated by the translation program to voice.

Which is to say, the receiver will hear the sentence translated into the selected language, and will repeat the process in reverse, thus establishing oral communication between the two translator machines.

On ending communication, the process will be deactivated.

In the case of communication by telephone, the process is the same but there is no visualisation on the screen, due to the absence of this, of the spoken and translated texts.

For translation on a single system:

The start button, which can be located on the machine or on the microphone, is pressed, activating the voice recognition program, and at the same time these are displayed on the screen of the sender.

The sender should speak in short and clear sentences, which will aid dialogue, as well as aiding the internal process of the microprocessor.

Immediately, the start button is again pressed, giving the order to simultaneously activate two programs. One to translate the text on the screen into the language required and the other to convert the text to voice in the required language.

The button is pressed for a third time and the system frees the memory and inverts the order of the languages on the menu, giving the receiver the option of becoming the sender. This user speaks into the microphone in their language and the process is repeated in reverse.

Thanks to this new simultaneous translation system and procedure, we are able to communicate with other people without having any knowledge of their language and vice versa, and at the same time it aids language learning in a very effective and practical way.

5

Embodiments of the present invention will hereinafter be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 shows a diagram of the component elements of a simultaneous translation system.

10 Figure 2 shows a diagram representing operation in the case of connection via the Internet.

Figure 3 shows a diagram of the data processor.

15 The new system comprises a portable housing-casing (1) which holds a data processor (2), a hard drive (3), the necessary software (dictionaries, language translators and voice reproducers), a modem providing connection to the Internet (4), a printer output port (5), a compact disk drive (6), a liquid crystal display screen (7) for the control menu and another used to read the last sentence in use (8), a telephone with input and output lines (9), a microphone  
20 (10), headphones or earphones (11), a cassette recorder (12), loudspeakers (13), a battery or power cell (14) and finally a keyboard (15) connection for use by people with impediments or disabilities.

25 Once the system is connected, either via battery or to the mains supply, a menu (16) is displayed from which both the input and output language (17) should be selected, which is to say, the language which the user wishes to translate and the language into which this should be translated in spoken form.

30 Two methods of using the translator device exist, it either being employed between two different systems or on a single system.

In the case of using two different systems, the connection is established via modem connected to the Internet (4) or by telephone (8).

35 In the case of connection via the Internet (4), the procedure detailed below is followed:

In the case of two different systems, once the languages (17) have been chosen from the start menu (16) the connection is established either via modem to the Internet or by telephone and the number of the receiver with which the user wishes to speak is dialled, this possessing the same simultaneous translation system.

A message notifies the receiver that the sender wishes to communicate with them via the simultaneous translation device.

The mode of communication will be via keyboard (15), microphone (10) or a hands-free microphone and earphones set (11).

Immediately, the voice recognition (19), translation (20) and dictionary (21) programs are activated (18).

From this moment on the sender is able to speak into the microphone (10) on their system, clearly and precisely, the voice program processing the signal and transcribing it to text.

Once the signal has been processed and transcribed to text, the translation program (20) is executed that translates the text into the language (17) previously selected.

Said texts can be viewed on both the sender system and the receiver system.

At this moment, the voice program (19) is activated on the receiver system which carries out the inverse function by converting the text translated by the translation program (20) to voice.

On ending communication, the process (22) is deactivated.

In the case of communication by telephone, the process is the same but there is no visualisation on the screens (7)(8), due to the absence of these, of the spoken and translated texts, nor is the keyboard (15) physically present. In the case of a single system:



The start button, which can be located on the machine or on the microphone (10), is pressed, activating the voice recognition program (19), and at the same time displaying these on the screen of the sender, once the language (18) has been selected from the start menu (17).

5

Immediately after, the start button is again pressed, giving the order to simultaneously activate two programs. One to translate the text (21) on the screen into the language required and the other to convert the text to voice in the required language (17).

10

The button is pressed for a third time and the system frees the memory and inverts the order of the languages (17) displayed on the menu (16), giving the receiver the option of becoming the sender. This user speaks into the microphone (10) in their language and the process is repeated in reverse.

15

In a new version of the system the hard disk (3) is replaced with ROM or EPROM memory, which will hold the translation program.

The main purpose of the compact disk drive (6) is for this to be read in order to load dictionaries into the RAM, which will be interpreted by the programs residing in the ROM or EPROM memory, being controlled via a menu, making it possible to restore translator system dictionaries, it not being necessary, therefore, for the dictionaries compact disk to be present for the system to operate.

25

The processor consists of three differentiated parts, the first of these being the spoken word processor (1), which is responsible for converting the sounds received by the microphone into processed words in the language being captured.

30

The second element is the text translator (21), whose function is, via the translation program, to translate the entered text into the language that has previously been specified.

35

The third element is the sound synthesising unit (23), whose purpose is to synthesise voice from a text in any language.

It should be mentioned that control of the system is carried out by a fourth program element designed for this purpose. This is responsible for synchronising the various inputs and outputs required for the correct operation and performance of the apparatus itself.

5

The processing procedure for the translation is the following:

Firstly, processing is carried out by the spoken word processor (19), next processing is carried out by the text translator (21) and finally processing is carried out by the sound synthesiser (23) for a certain sender language.

10

Operation is the same for the receiver language, this should simply be specified using the translator configuration menu.

15

It will be appreciated that variations in, and modifications to, the embodiments described and illustrated may be made within the scope of the appended claims.

### **CLAIMS**

1. A system for simultaneously translating text in a first language into a second language, said system comprising processor means with associated  
5 memory arranged to translate text in the first language into the second language, and user interface means in communication with said processor means, wherein said system further comprises a modem for establishing a connection between the system and a source of text in the first language.
- 10 2. A system for simultaneous translation as claimed in Claim 1, wherein said source of text is written and is retrieved from the Internet via said modem.
3. A system for simultaneous translation as claimed in Claim 1 or Claim 2,  
15 wherein said source of text is spoken and is communicated to said system by telephone via said modem.
4. A system as claimed in any of Claims 1 to 3, further comprising means for  
generating a voice representation of the text in the second language after  
translation.
- 20 5. Simultaneous translation system comprising a data processor (2), a hard disk (3), the necessary software (dictionaries, language translators and voice reproducers), a modem providing connection to the Internet (4), a printer output port (5), a compact disk drive (6), a liquid crystal display screen for the control  
25 menu (7) and another used to read the last sentence in use (8), as well as a telephone with input and output lines (9), a microphone (10), headphones or earphones (11), a cassette recorder (12), loudspeakers (13), a battery or power cell (14) and a keyboard connection (15).
- 30 6. Simultaneous translation procedure as claimed in any preceding claim, wherein for connection between two different systems, once connected, either by battery to the mains supply, a menu will be displayed (16) from which it is possible to select both the input and output languages (17) for the sender system, being able to establish the connection either via a modem connected to  
35 the Internet (4) or by telephone (8).

7. Simultaneous translation procedure as claimed in any preceding claim, wherein connection via the Internet, once the languages (17) are selected from the start menu (16), in the case of two different systems connected via modem to the Internet, the number of the receiver with which the user wishes to speak is  
 5 dialled, this possessing the same simultaneous translation system, a message immediately notifies the receiver that the user wishes to communicate with them via the simultaneous translation device, the mode of communication being either via keyboard (15), microphone (10) or a hands-free microphone and earphones set (11); once the input and output languages (17) have been chosen from the  
 10 start menu (16), the voice recognition (19), translation (20) and dictionary (21) programs are activated (18), from which moment the sender is able to speak into the microphone (10) on their system, clearly and precisely, and once the signal is processed and transcribed to text, the translation program (20) is executed which translates the text into the language (17) previously selected, being able  
 15 to view this on both the sender system and the receiver system.

8. Simultaneous translation procedure as claimed in any preceding claim, wherein once the voice to text conversion program (19) and the text translation program (21) have been executed, on the receiver system the voice program  
 20 (19) that carries out the inverse function of converting the text translated by the translation program (20) to voice is activated, and on ending communication the process is deactivated (22).

9. Simultaneous translation procedure as claimed in any preceding claim, wherein in the case of communication by telephone, the process is the same but  
 25 without visualisation on the screens (7)(8), due of the absence of these, of the spoken and translated texts, nor is the keyboard (15) physically present.

10. Simultaneous translation procedure as claimed in any preceding claim, wherein the procedure may operate on a single system, for which it is necessary  
 30 to press the start button, which may be located on the machine or on the microphone (10), thus activating the voice recognition program (19), at the same time these are displayed on the screen of the sender, once the language (17) has been selected from the start menu (16); immediately the start button is  
 35 again pressed giving the order to simultaneously activate two programs; one to translate the text (20) on the screen into the required language and the other to

convert the text to voice in the required language (19); pressing the button a third time frees the memory of the system and reverses the order in which the languages (17) are displayed on the menu (16), giving the receiver the option of becoming the sender, who will then speak into the microphone (10) in their language, the oral translation being heard through the loudspeaker (13), when the translated voice output is activated, thus finishing the cycle.

11. Simultaneous translation procedure as claimed in any preceding claim, wherein the data processor (2) consists of three differentiated parts: the spoken word processor (19), the text translation processor (21) and the sound synthesiser (23).

12. Simultaneous translation procedure as claimed in any preceding claim, wherein the hard disk (3) is replaced by ROM or EPROM memory, which will hold the translation program.

13. Simultaneous translation procedure as claimed in any preceding claim wherein the main purpose of the compact disk drive (6) is for this to be read in order to load dictionaries into the RAM memory, which will be interpreted by the programs residing in the ROM or EPROM memory, being controlled via a menu, making it possible to restore dictionaries in the translation apparatus, it not being necessary, therefore, for the dictionaries compact disk to be present for the system to function.

14. Simultaneous translation procedure as hereinbefore described with reference to the accompanying drawings.



Application No: GB 9914060.0  
Claims searched: 1-14

Examiner: Melanie Gee  
Date of search: 24 January 2000

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.R): G4A (AUDL)

Int Cl (Ed.7): G06F 17/28T

Other: Online: WPI, EPODOC, PAJ, INSPEC, COMPUTER, Internet

**Documents considered to be relevant:**

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2014765 A (SON et al.), see whole document.	1, 2, 4 at least
X	EP 0327408 A2 (ADVANCED PRODUCTS & TECHNOLOGIES), see whole document.	1, 2, 4 at least
X	WO 95/16968 A1 (GACHOT), see whole document.	1, 2, 3, 4, 5, 8, 9, 11 at least
X	DE 19607121 A (STRYCKER), see abstract.	1, 2, 4 at least
X	US 4393460 A (MASUZAWA et al.), see whole document.	1, 2, 4 at least
X	H Tanaka, "Artificial Intelligence in the Pacific Rim. Proceedings of the Pacific Rim International Conference on Artificial Intelligence", 1991, pages 11-16, A Kurematsu, "A perspective of telephone interpretation research", and also DIALOG Accession No. 04352845.	1, 3, 4 at least
A	M Davison, "Language: no barrier to business", "Natural language translation" Web page, at <a href="http://www.rightwords.co.uk/lang.html">http://www.rightwords.co.uk/lang.html</a> , of the "Rightwords" Web site at <a href="http://www.rightwords.co.uk/">http://www.rightwords.co.uk/</a>	

X Document indicating lack of novelty or inventive step  
Y Document indicating lack of inventive step if combined with one or more other documents of same category.

& Member of the same patent family

A Document indicating technological background and/or state of the art  
P Document published on or after the declared priority date but before the filing date of this invention.

E Patent document published on or after, but with priority date earlier than, the filing date of this application.



The  
Patent  
Office



INVESTOR IN PEOPLE

Application No: GB 9914060.0  
Claims searched: 1-14

Examiner: Melanie Gee  
Date of search: 24 January 2000

12

Category	Identity of document and relevant passage	Relevant to claims
X	AltaVista's translation service at <a href="http://babelfish.altavista.com/">http://babelfish.altavista.com/</a>	1 & 2

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

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